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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,604	06/09/2006	Friedhelm Schmitz	2003P11480WOUS	2799

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SIEMENS CORPORATION  
INTELLECTUAL PROPERTY DEPARTMENT  
170 WOOD AVENUE SOUTH  
ISELIN, NJ 08830

EXAMINER
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BLACKWELL, GWENDOLYN

ART UNIT	PAPER NUMBER
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1794

MAIL DATE	DELIVERY MODE
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01/07/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/582,604	<b>Applicant(s)</b> SCHMITZ ET AL.	
	<b>Examiner</b> GWENDOLYN BLACKWELL	<b>Art Unit</b> 1794	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 31-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 31-43 and 46-48 is/are rejected.
- 7) ☒ Claim(s) 44-45 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

*(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.*

2. Claims 31-32, 36, 38-39 and 48 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent no. 5,190,598, Qureshi.

#### *Regarding claims 31-32 and 46*

Qureshi discloses steam turbine components having an improved erosion resistance coating comprised of a boride layer (TBC) coated with a sealing layer (erosion-resistant layer). The boride layer has a plurality of cracks (porous) which are sealed by the sealing layer, (columns 2-3, lines 64-5). The sealing layer includes a hard coating material such as chromium carbide and tungsten carbide, (column 4, lines 5-14). As the sealing layer protects the underlying porous layer, it would be expected that the sealing layer is less porous than the underlying layer absent an objective showing to the contrary, meeting the limitations of claims 31-32 and 46.

#### *Regarding claims 38-39 and 48*

The component can specifically be a rotating blade, (column 3, lines 20-27), meeting the limitations of claims 38 and 48.

The material of the base component is steel which is an iron based alloy, (column 3, lines 20-27), meeting the limitations of claim 39.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 31-34, 36-43, and 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent no. 4,248,940, Goward et al in view of United States Patent no. 6,302,318, Hasz et al further in view of United States Patent no. 5,350,599, Rigney et al and United States Patent no. 4,446,199, Gedwill et al.

*Regarding claims 31, 36-39, and 47*

Goward et al disclose a thermal barrier coating using stabilized zirconium oxide used in systems such as combustion chambers, transition ducts and after burner liners in gas turbine engines as well as vane platforms and air foils, (column 1, lines 9-17). The thermal barrier coating also includes a bond coat between the zirconium oxide layer and the substrate, (column

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2, lines 28-68). Goward et al does not specifically disclose a metallic erosion resistant layer that is less porous than the ceramic layer upon which it is formed.

Hasz et al disclose a wear resistant coating utilized on turbine components wherein the coating is the outermost coating and can be comprised of a mixture of chromium carbide and Ni-Cr, (column 2, lines 44-61).

Rigney et al disclose an erosion resistant thermal barrier coating utilized on turbine components wherein the coating is comprised of a bond coat, a porous sublayer, and a top sublayer that is less porous than the layer upon which it is formed, (columns 2-3, lines 66-45).

Goward et al, Hasz et al, and Rigney et al disclose analogous inventions related to protective coatings formed on substrates which are used as turbine components. It would have been obvious to one skilled in the art at the time of invention to modify the coating of Goward et al with the protective coating of Hasz et al in order to provide additional erosion support. Hasz et al is also used to show that it is known in the art to use the aforementioned composition as wear/erosion coatings on turbine components. It would have also been known in the art at the time of invention to modify the modified thermal barrier coating of Goward et al with the porosity structure of Rigney et al in order to ensure that the top coating is less porous than the layer upon which it is formed in order to provide an erosion resistant layer that is more erosion resistant and thereby protects the underlying structure and substrate against erosion damage, (Rigney, column 3, lines 46-66), meeting the requirements of claims 31-34, 36-40, and 46-47.

*Regarding claim 35*

Modified Goward et al do not disclose that the erosion resistant layer is nickel-chromium with the particular admixtures as claimed.

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Gedwill et al disclose a substrate used as part of a turbine engine wherein the component is comprised of a metal substrate coated with a base coating (TBC) and a top coating (erosion-resistant). The top coating is an erosion resistant alloy of nickel, cobalt, or iron, (column 2, lines 12-18). The top coat can have the formula of Ni-20Cr-5Al-0.3Y, (column 3, lines 31-39), which would correspond to a mixture of nickel-chromium with an admixture of nickel-aluminum.

Modified Goward et al and Gedwill et al disclose analogous inventions related to the use of erosion resistant coatings on turbine engine components. It would have been obvious to one skilled in the art at the time of invention to substitute the coating of modified Goward et al with the coating of Gedwill et al as they are both in the same field of endeavor for substantially the same purpose to protect the underlying layers.

*Regarding claims 41-43*

The bond coat can be a Ni-Cr-Al alloys (Goward, column 2, lines 28-36) which would also include the Ni-Cr-Al-Y wherein Y can include yttrium, (Rigney, column 4, lines 51-65), meeting the requirements of claim 41.

As the coating meets Applicant's structural requirements it would be expected that the coating would also meet the operational limitations as exemplified absent an objective showing to the contrary, meeting the requirements of claims 42-43.

***Allowable Subject Matter***

6. Claims 44-45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

7. Applicant's arguments filed September 9, 2009 have been fully considered but they are not persuasive with regards to 35 USC 102(b) rejection by USPN 5,190,598, Qureshi. Applicant contends that the boride coating is an intermetallic compound not a ceramic as claimed. This is not persuasive as the passage cited by Applicant is in the background section not part of the disclosure for the present invention. The cited passage does not overcome the rejection.

8. Applicant's arguments, see page 7, filed September 9, 2009, with respect to the rejection(s) under Gedwill et al and Albrecht et al have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of as set forth above.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GWENDOLYN BLACKWELL whose telephone number is (571)272-5772. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/GWENDOLYN BLACKWELL/  
Primary Examiner, Art Unit 1794